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Aristotle's Enthymeme and Nonmonotonic Logics

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Aristotle's Enthymeme and Nonmonotonic Logics

by

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In this paper I explore the usefulness of nonmonotonic logics within the domain of enthymematic reasoning. Nonomonotonic logics are logical systems that do not require certain and complete information and allow for fallibilistic or merely plausible reasoning. In order to bring the work of contemporary nonmonotonic logical theory into the realm of rhetoric, I provide a brief sketch of the history of logic in the twentieth century and argue that the hostility between rhetoricians and logicians is in part a result of broad misunderstanding. An understanding of contemporary rather than a Fregean, turn-of-the-twentieth-century metatheory could provide the rhetorician with a useful tool for explaining different reasoning patterns in the overlap between logical domains and rhetorical situations. After sketching the relationship between nonmonotonic and classical logics, I argue that nonmonotonic logics could be useful for modeling the type of reasoning Aristotle presents with his conception of the enthymeme. To show the rhetorical function of nonmonotonic logics, I examine plausibilistic reasoning in two texts: an excerpt on diagnosing chronic cystic disease from L.V. Ackerman's 1970 textbook Cancer and an early speech on university education from John Stuart Mill. These seemingly incongruent examples are not provided in an effort to show that

nonmonotonic logics can account for all instances of rhetorical reasoning but are instead provided to show an understanding of logical domains can be useful in radically dissimilar rhetorical situations.

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In this paper I argue that consistencies between Aristotle's enthymeme and nonmonotonic logics – non-classical logics that allow for fallibilistic or merely plausible reasoning – are worth exploring. The world of non-classical logics offers compelling possibilities for rhetoricians, even if these possibilities are shrouded in vocabularies of analytic philosophy that are seemingly inconsistent or incompatible with those of the rhetorician. It is something of a commonplace to point to the quarrel between philosophers and rhetoricians, to an agonistic history between two fields with radically different epistemological stances. There are endless places to point within this history of tension between accounts of logic and rhetoric. Perhaps Perelman and Olbrechts-Tyteca's distinction in *The New Rhetoric* between argumentation and demonstration is one of the more useful. For them, the rhetorician's reasoning takes the form of argumentation – a discursive approach that relies on a series of contingencies and probabilities. In so far as there are rules, they act as practical guides for developing an argument, not as arbiters of truth. Reasoning for the philosopher-logician takes the form of demonstration. She applies a universal model of rationality to the world. If parties disagree, then at least one of the demonstrations must be flawed.

I would argue that the rhetorician's understanding of the philosopher-logician has changed very little in the nearly sixty years since *The New Rhetoric*. In that time, some have explored anti-empiricist temperament within rhetoric and composition studies (Charney 1996; Connors 2000; Haswell 2005) And others have claimed former analytic philosophers for rhetoricians when those thinkers turned from their logico-mathematical pasts (Rorty 1989, Toulmin 1964). However, there has been very little to update the inter-

disciplinary understanding that Perelman and Olbrechts-Tyteca sketch. Philosopher-logicians accuse rhetoricians of sophistry: rhetoric is at best portrayed as a trivial study of tricks for clear communication[1] and at worst as a rigorless study of manipulation and artful lies. Rhetoricians reclaim "sophistry" and contend that contemporary philsopher-logicians are consistent with a philosophical tradition that has always misrepresented and maligned the sophistic tradition: logical theory is at best portrayed as a naïve Enlightenment project that has no bearing on real world argumentation or composition instruction and at worst as a part of some sort of phallogocentric, undemocratic project that, in its misrepresentations of the rhetorical situation, reinforces a hegemonic structure. There has been little change to the disciplines' history of poor collaboration.

What follows is an attempt to begin inter-disciplinary communication by way of an exploratory venture into the world of contemporary logical theory. The last half century's growth in non-traditional or non-classical logics and pragmatic and pluralistic logical metatheory suggests that the philosopher-logician is moving closer to the realm of rhetoric (Quine 1950; McDermott & Doyle 1980; Beall and Restall 2000 & 2006). Moreover, with the influence of computer science, artificial intelligence, and cognitive science, there have been more attempts to descriptively model incomplete and inconsistent human reasoning and communication processes. The formal and mechanistic world of logical theory is entering areas where the certainty associated with classical logics and mathematics is impossible to find. With such changes we see a renewed philosophical interest in rationality as located *within* particular contexts. This requires a pluralistic account of logic that allows for multiple rationalities specific to particular reasoning situations. Demonstration is seemingly becoming less of a universal,

prescriptive arbiter and more of a local, descriptive tool. Unlike a positivist tradition that attempted to construct the *one true logic*, this new approach constructs and uses logics in so far as they are productive for modeling particular phenomena.

In exploring the relationship between nonmonotonic logics and the Aristotelian enthymeme, this paper is not attempting to add to the conversation about Aristotle's enthymeme by showing that it looks like a nonmonotonic logic or a mode of nonmonotonic reasoning; it is instead a paper that adds to the conversation about the relationship – intellectual and political – between rhetoric and logic by exploring potential connections between the enthymeme and formal nonmonotonic reasoning systems. This paper is part of a larger argument that non-classical logics have rhetorical value that is, at the very least, worth exploring.

Classical & Non-Classical Logics

Critical to an understanding of the way that nonmonotonic logics relate to the rhetorician's typical conception of logic is an understanding of the relationship between classical and non-classical logics. "Classical," in the sense of "classical logics," does not necessarily refer to the classical world of Aristotle but instead refers to a traditional set of logical axioms. Before exploring the axiomatic differences between classical and non-classical logics, it will first be productive to examine differences in logical metatheory – philosophical accounts of the roles and properties of logical systems. By examining historical shifts in metatheory, we can see how Logic as a discipline has changed since Perelman and Olbrechts-Tyteca's famous description. Looking to such shifts offers the rhetorician a different conception of logic, one that sees it as a useful tool for

understanding particular domains or discursive situations rather than as a prescriptive force that determines acceptable human reasoning.

In a work with an argument that parallels my own and to which my argument is much indebted, Keith Stenning and Michiel van Lambalgen contend that Psychology's rejection of logic is a result of a misunderstanding of what logics do. To make this claim they point to the differences between Gottlob Frege's logical idealism and Edmund Husserl's account of semantics. Both reject logical psychologism, a popular nineteenth century account that views logical laws as a presentation of psychological laws. Logical psychologism holds that laws should describe empirical human reasoning events. However, Husserl and Frege differ in the sources of their rejection. Frege argues that logical and mathematical knowledge are objective and necessarily true of the world inside or outside of the interiority of psychological phenomena:

> If we could grasp nothing but what is in ourselves, then a [genuine] conflict of opinions, [as well as] a reciprocity of understanding, would be impossible, since there would be on common ground, and no idea in the psychological sense can be such a ground. There would be no logic that can be appealed to as an arbiter in the conflict of opinions. (*Grungesetze der Arithmetik* from Stenning and van Lambalgen 10-11)

This notion of logic as the "arbiter in the conflict of opinions" is exactly the sort objective, normative account that twentieth century rhetoricians like Perelman and Olbrechts-Tyteca reject. Husserl distances his account from Frege by separating the normative and the mathematical.

While Husserl is still presenting a mathematical account of consequence as truth preservation, his account shifts from Frege in that, with an account of semantics, he is

trying to preserve particular kinds of truth in particular kinds of situations (12). Husserl explains:

> The objective correlate of the concept of a possible theory, determined exclusively in terms of its form, is the concept of a possible field of knowledge over which a theory of this form will preside. [This field] is characterized by the fact that its objects are capable of certain relations that fall under certain basic laws of such and such a determinate form (*Formale und tranzsendenale Logik*, from Stenning and van Lambalgen 13)

Logical laws are no longer true of the objective world as a whole; they are instead true of a semantics that accounts for particular situations. This is a fine point and perhaps not especially striking at first glance. However, importantly Husserl is here presenting a much more modern account than Frege. By presenting semantics as bases for laws, he accounts for logical domains, particular areas where particular logical systems can account for formal consequence. Such an account allows us to view logics as descriptive tools useful for modeling situations, not as prescriptive tools after which to model discursive situations. While Husserl is still interested in presenting an account of logical laws that establishes and maintains truth, he is no longer arguing that these laws are universally applicable. Instead, they are applicable for semantic systems. Of course, Husserl is not a sophist; he clearly does not establish an account of truth that many rhetoricians would support. Yet, he does present an account of logical theory that is more useful. What is most important here is the shift from objective idealism to semantics. In so far as both cling to notions of objectivity and truth, they are deeply problematic; however, by insisting on particular semantic structures – particular reasoning situations – Husserl opens the door for more pluralistc and descriptive logical metatheories.

Stenning and van Lambalgen contend that the contemporary psychologists' conception of logic relies on a Fregean account and refers almost exclusively to classical logics. They explain that logic is classical if it accepts four parameters:

> 1. [*syntax*] fully recursive language: if φ, ψ are formulas then so are ¬φ, φ→ψ, φ ∨ ψ, φ ∧ ψ, ….;
> 2. [*semantics*] truth-functionality: the truth-value of a sentence is a function of the truth-value of its components only;
> (2'. As a consequence: evaluation of the truth-value can be determined in the given model (*the semantics is extensional*));
> 3. [*semantics*] bivalence: sentences are either true or false, with nothing in between;
> 4. [*consequence*] the Bolzano-Tarski notion of consequence. (25-26)

These require unpacking. First, a sentence is a well-formed formula. Well-formed formulas have truth-values. Whether a formula is well-formed depends on the rules of particular formal languages. Of course, these rules vary greatly, and the complications of such variation are beyond the intended scope of this paper. For my purposes it is best to consider formulas simply as the parts that make up sentences. A sentence is necessarily a formula, but a formula is not necessarily a sentence.

Parameter 1. is simply the claim that if formulas are combined and altered in ways consistent with the rules of logical modifiers, those new modifications are also formulas. 2. and 3. are more interesting for the rhetorician. 2. and 2'. require that the truth values of individual parts of a sentence determine the truth value of the sentence. If the sentence φ is true and the sentence ψ is true, then necessarily the sentence φ & ψ is true. This may at first seem uninteresting; however, when combined with 3., it becomes clear that these parameters make modeling almost all human reasoning impossible. 3. – a variation on Aristotle's law of the excluded middle – will be more familiar to rhetoricians. When this is combined with 2., the uncertainty inherent in a sentence like "If it is raining, then my

students will have rain gear" becomes impossible to model. If the proposition "it is raining" can only be true or false, then there is no way to account for middle cases in between a sunny day and a monsoon. If there is mist, is the proposition "it is raining" true or false? If it is true, would the appearance of a single student dressed in gym clothes make our original sentence false? If we classify a student in gym clothes as an instance where the proposition "my students will have rain gear" is false, then, given parameters 2. and 3. the sentence must be false. Classical logics account for uncertainty very poorly. This makes them poor models for human reasoning; however, they are useful for modeling the sorts of demonstrations made in classical mathematics.

Monotonicity

Crucially, classical logics are monotonic: given a set of premises Φ and a set of possible conclusions Ψ, as Φ grows Ψ necessarily grows as well.[2] This defining feature, though formally accurate, does not well communicate the pragmatic work that monotonicity does. Monotonic logics are useful for accounting for arguments that move in one direction with certainty. Of course, given the rarity (or arguable absence) of certain information in natural language argumentation, such logics value as a model for real world argumentation is very limited.

Growing out of such modeling problems, computer and cognitive scientists and artificial intelligence researchers began developing logical systems without monotonicity. They described this particular non-classical logic as nonmonotonic. Unlike classical logic, nonmonotonic logics allow for non-linear reasoning – reasoning that begins with

uncertain, incomplete information and corrects itself when necessary. In their seminal paper on the subject McDermott and Doyle explain:

> 'Non-monotonic' logical systems are logics in which the introduction of new axioms can invalidate old theorems. Such logics are very important in modeling the beliefs of active processes which, acting in the presence of incomplete information, must make and subsequently revise assumptions in light of new observations. (41)

One may reject a previously asserted conclusion on the basis of a new premise. As such only nonmonotonic logics allow a reduction in the number of possible conclusions as the number of premises increases. These logics are designed to resemble real world reasoning, reasoning drawn from incomplete information. They allow one to move from the premise "Jimmy is a bird" to the conclusion "Jimmy flies." Just as with Aristotle's enthymeme, nonmonotonic logics do not require all of the premises that would be necessary for proof in a classical logic. In this instance, one need not state the claim "All birds fly" to conclude that Jimmy flies. Though uncertain, the move from "is a bird" to "flies" is a default assumption. However, with another premise, with more complete information, one could reject the initial conclusion. If one adds the premise "Jimmy is a penguin," one could reject the previous conclusion and instead assert, "Jimmy cannot fly." In this way, nonmonotonic logics provide a means to formalize something not unlike Toulmin's conditions of rebuttal or exception (101).

What is perhaps more interesting than these rebuttal or exception mechanisms is what these mechanisms allow. Since the system provides a means to revise previously held conclusions, it can function as a tool for modeling fallible or plausibilistic reasoning. The premises within an argument and the sort of connective tissues binding arguments need not be necessary but can instead be plausible or consistent with the appearances of a

particular reasoning situation. The difficulty with this sort of logic lies in formalizing the communal knowledge on which the reasoner relies. To construct an accurate model of plausibilistic reasoning one would need an accurate understanding of a reasoner's default assumptions. This is almost certainly an infinitely complex task; however, it is also a task consistent with the rhetorician's work of engagement with the social, historical, or biographical circumstances that the rhetorical action lives in.

Aristotle's Enthymeme

I would like to turn to two seemingly contradictory passages in Book II of the *Rhetoric*. This contradiction is in no way singular within the text, but it – like many of the work's other contradictions – points to an uncertainty about the role of logic within rhetoric. Describing arguments from past fact in II.19 Aristotle claims, "that if the less likely of two things has occurred, the more likely must have occurred also" (1392.b.15-16). For instance, to explain the move from a claim about a preceding event to a conclusion about a subsequent event Aristotle describes thunder and lightning: "if it has lightened, it has also thundered" (1392.b.27). Given that one event cannot occur without the other, the probability of lightning and thunder must be exactly the same. Given the obvious counterexamples that stem from Aristotle's claim about the less and more likely things, how are we supposed to read these claims? It seems these can only be argumentative strategies rather than formal rules of syllogistic reasoning. That is, to argue that when the less likely thing occurs the more likely certainly occurs is a method of argumentation that *appears* reasonable. It is a plausible conclusion to draw. Aristotle suggests reasonable lines of assumption, not a rule of necessary consequence. The reasonable lines of assumption give the rhetor probable lines from which to build an

argument. Aristotle explains, "Of all these sequences, some are inevitable and some merely usual" (1392.b.32). Some consequences are necessary and others are probable. Probable consequences allow for the sort of obvious counterexamples that I have pointed to.

However, Aristotle also includes II.24 on apparent enthymemes: "Besides genuine syllogisms there are syllogisms that appear genuine but are not; and since an enthymeme is merely a syllogism of a particular kind, it follows that besides genuine syllogisms, there may be those that look genuine but are not" (1400.b.34-38). Why are some syllogisms and enthymemes only apparently genuine? This distinction mirrors valid and invalid arguments. Jonathan Lear explains that unlike modern logicians who have notions of both semantic and syntactic consequence, Aristotle's syllogistic theory only has the notion of syntactic consequence (1-2). Semantic consequence looks to truth-values to define validity. If a conclusion is always true when the premises are all true, then the argument is valid. Syntactic consequence uses a set of rules to explain this connection. If all logical rules of consequence are applied appropriately, then an argument is valid. Aristotle's genuine syllogisms are those that follow appropriate rules of consequence; however, Aristotle has no means of determining consequence by examining truth-values. Aristotle's syntactic rules are determined by perfect first figure syllogisms, those whose truth is self-evident. This syntactic-semantic distinction is important because it shows that for Aristotle formal structures are verified by the way they match up with rules, not by truth preservation. In the case of the syllogism, these syntactic, rule-based verifications would align evenly with the semantic, truth-preservation verification.

However, Aristotle does not offer this logical explanation to describe the failings of the merely apparent enthymemes in *Rhetoric*. Given that the consequences within an enthymeme need only be "usual," this reduction to first figure, axiomatic truths would be impossible. Instead, he offers II.24 – a list of mistakes, common fallacies in reasoning. In one example Aristotle claims that one line for apparent enthymemes "is to assert of the whole what is true of the parts, or of the parts what is true of the whole" (1401.a.24). On its surface this seems to be a fairly reasonable rule that Aristotle defends by showing where enthymemes with such arguments can go awry. However, in II.19 when describing genuine arguments from the possible and impossible Aristotle suggests that we can make particular claims relating the whole and the parts: "That where the parts are possible, the whole is possible; and where the whole is possible, the parts are usually possible" (1391.a.29-31). Given that the parts have the quality of being possible, we can assert this of the whole as well. This move from a quality of the parts to a quality of the whole is exactly what Aristotle has listed as an apparent enthymeme in II.24, What he originally offers as a guide to better arguments becomes a mark of a mistaken argument. This contradiction points to the difficulty of drawing formal rules of consequence (rules that Aristotle appears anxious to form) when such consequence is only probable or plausible.

Enthymeme within Two Fields

Thomas M. Conley attempts to place such problems in perspective by examining the use of "enthymeme" before and after Aristotle. He argues that "nowhere outside of Aristotle does *any* notion of enthymeme as syllogistic creature *or* as stylistic turn play a very important part in rhetorical theory" (180). The hyper-logical, syllogistic conception

of enthymeme that is dominant outside of rhetorical scholarship is largely a product of Aristotle. Lloyd Bitzer writing almost thirty years before Conley suggests that this is the dominant definition within logic textbooks. Walton, referring to the term's usage within logic and Artificial Intelligence, writes, "An enthymeme, in current usage, is an argument that has one or more premises, or possibly a conclusion, not explicitly stated in the text, but that needs to have these propositions explicitly stated to extract the complete argument from the text" (2001, 93). Of course, it is largely accepted in rhetorical circles that current usage in these fields does not align perfectly with Aristotle's usage in *Rhetoric*.

Conley's more important claim is that this syllogistic frame is still dominant even when rhetoricians reject these purely formal accounts. In turning to Aristotle, they are turning to an account of the enthymeme that was at best a minority view. He synthesizes prior rhetorical scholarship on the enthymeme, listing six elements consistent with such a discussion. Consider Conley's second and third elements:

> 2) One must be careful not to reduce "enthymeme: to a formalist conception. An enthymeme is not just a truncated syllogism, i.e., a syllogism with one or more parts left unexpressed.
> 3) If an enthymeme should be expressed as a truncated syllogism, it is so expressed for practical reasons, not for formal reasons. In general, one should elide any premise that would be obvious to one's audience, or otherwise risk insulting their intelligence. (169)

Rhetorical scholars since Bitzer have largely rejected formalist conceptions of the enthymeme, but they have still over-relied on the Aristotelian enthymeme and, as a result, neglected other accounts that were more prevalent in ancient rhetorical schools. Such neglect privileges an account of reasoning and rationality as consistent monotonic classical logics. Even if scholars reject accounts that view the enthymeme as merely a

truncated syllogism, in forwarding Aristotle's view they are still connecting its power to the power of the syllogism. The enthymeme works because it is very nearly a well-formed syllogism.

Also struggling with current formulations of Aristotelian syllogisms, Walton stresses the difference between modern logicians' notion of enthymeme – as an argument with at least one non-explicit premise or conclusion, as an imperfect syllogism – and the Aristotelian enthymeme (2001, 97). He points to the *Prior Analytics* in which Aristotle defines the enthymeme as "a deduction starting from probabilities or signs," a definition that gives the reader no sense that the enthymeme requires an implicit premise or conclusion (70.a.11). Instead this definition relies on the enthymeme's ability to engage with different modes of truth. In this sense the enthymeme is unique in that it may argue within the mode of demonstrative signs or within that of the probable. However, Walton does not reduce Aristotle's concept to this modal definition; instead, he suggests ways that we can read Aristotle as offering both the modal definition and the imperfect syllogism definition. The audience a rhetor addresses when delivering enthymemes accepts the probable as well as the demonstrative; moreover, this audience will not be persuaded by long abstract chains of argument. Walton explains, "In rhetorical persuasion, it seems that *eikotic* or plausibilistic[3] arguments are frequently combined with arguments that have nonexplicit premises or conclusions" (99). Walton, for all his willingness to return to Aristotle, shows the difficulty in connecting the rhetorical and logical definitions of enthymeme. Even though he provides a means to combine the modal and the imperfect definitions, one could still argue that this is a reductive way of

interpreting Aristotle. Bitzer criticizes Cope, DeQuincey, and Burney for providing such limited accounts (400).

Cancer

In an effort to show an area where a binary account of truth is ridiculous, Stenning and van Lambalgen cite a passage from L.V. Ackerman's 1970 medical textbook *Cancer*. I will reproduce this passage and show how an enthymematic reading inspired by theories of nonmonotonic reasoning is productive. Rhetoricians require little proof that bivalence is absurd; instead, this will be of greater interest as representation of a certain sort of knowledge claim. The 20th century medical text provides an avenue for exploring reasoning structures outside of an explicitly argumentative frame. With diagnosis, we see an instance where knowledge claims are represented as limited – as only applying often rather than constantly – but as highly useful. Both doctors diagnosing and researchers suggesting best diagnostic practices, negotiate between useful but broad scientific rules and the uncertainty that comes with treating different individual patients. In the act of applying such understandings to individual cases, these rules are both supported on the whole and undercut in the individual. The act of application is the process of bringing the formal and necessary into the concrete and contingent.

> Ackerman writes:
> Chronic cystic disease is often confused with carcinoma of the breast. It usually occurs in parous women with small breasts. It is present most commonly in the upper outer quadrant but may occur in other parts and eventually involve the entire breast. It is often painful, particularly in the pre-menstrual period, and accompanying menstrual disturbances are common. Nipple discharge, usually servous, occurs in approximately 15% of the cases, but there are no changes in the nipple itself. The lesion is diffuse without sharp demarcation and without fixation to the overlapping skin. Multiple cysts are firm, round and fluctuant and may transilluminate if they contain a clear fluid. A large cyst in the area of chronic

> cystic disease feels like a tumour, but is usually smoother and well-delimited. The auxillary lymph nodes are usually not enlarged. Chronic cystic disease infrequently shows large bluish cysts. More often, the cysts are multiple and small. (28)[4]

The notion of *eikos* mentioned above will be productive for this passage. Stenning and van Lambalgen note the prevalence of vague and probabilistic language in this passage. We should be careful in noting that here probability is not presented in terms of a statistical breakdown following careful experimentation or observation; instead, probability is presented with respect to the experience of the diagnosing professional. That is, rather than defending these claims with scientific studies, Ackerman instead presents his claims based on appearances. Consider the third sentence. With the hedging phrases "most commonly" and "may," Ackerman's confidence in a particular appearance is expressed to different degrees. In the former, he expresses the most likely appearance but does not expand on its statistical likelihood. In the latter, he explains that another appearance is possible if less common. Moreover, phrases like "upper outer quadrant" and "entire breast" do not receive careful explanation. There is no technical attempt to demarcate quadrants because such an attempt would not be productive. While such a technical approach might avoid fuzziness and model better within classical logical systems, it would almost certainly be reduced to absurdity when diagnosing physicians encounter different bodies.

Such vague and probabilistic phrases are consistent with the diagnosing physician's relation to a reasoning system. Classical bivalent logics are rendered absurd by the allowances and variations necessary to make claims about an entire population of bodies. Also, a mathematical notion of probability is inconsistent with the sorts of claims

that Ackerman is here making. This is closer to what Walton refers to as subjective probability or plausibility – closer to Aristotle's notion of *eikos* (88, 2014). It is a claim that is based critically but informally on one's past experiences rather than on constructed, formal experiments or observations that are intended for statistical analysis. For instance, the phrase "most commonly" could cover a wide range of quantitative probabilities depending on its situation. More importantly, this phrase presents the reader with a reasonable procedure for action. While the diagnosing physician cannot be certain that a patient has chronic cystic disease merely because of the presence of small lumps in the upper outer quadrant of the breast, she does have reason to investigate further. She has reason to entertain a productive path of inquiry – reason to make tentative, contingent conclusions. We can read "most commonly" as a sign to make just such a tentative conclusion, and we can read "may" as a sign of possible alternatives. Throughout this passage Ackerman gives the reader signs for diagnosis and then presents alternative less common scenarios. He presents his audience with a way of engaging with a particular set of appearances.

Diagnosis is a matter of experience, of recognizing patterns in a situation where information is incomplete yet overabundant. Here Ackerman models this process for his audience. He almost certainly has more experience than would the intended audience of his textbook; however, he also must assume necessary levels of experience. The enthymeme functions as a tool to connect both his own and his audience's appearances. Ackerman does not provide his audience with a complete description of every element of diagnosis. He assumes that they have their own experiences and that inform appearances they have in diagnosing a patient. Phrases like "upper outer quadrant," though presented

in a sort of scientistic diction, point to such enthymematic reasoning. Ackerman is able to avoid the absurdity of a more complete, technical demarcation by relying on his audience's experience, by what they bring to his argument. Moreover, Ackerman's methods for recommending strategies suggest nonmonotonic reasoning. He is suggesting potential possibilities, modeling contingent conclusions that can either be maintained or discarded with more information.

Universities

In an 1826 speech given at an early meeting of the London Debating Society, the young John Stuart Mill argues "the most important quality of the human intellect is its progressiveness, its tendency to improvement" (349). He claims that a professorship made up of clergymen is counter to progressive thought. Mill, a founding member of the debating society, is clearly presenting Enlightenment ideals of knowledge. And more importantly, the nineteen-year-old Mill's rhetorical form of argumentation mirrors its content. Within this speech, Mill's prose is almost conspicuously clear; it seems as though he is attempting to argue on stage as if constructing a demonstrative proof, presenting his claims in a manner that foregrounds a sort of syllogistic structuring:

> The very idea of progressiveness implies the questioning of all established opinions. The human intellect is only in its right state when everything that is believed is believed on evidence. This supposes enquiry. (350)

Mill is setting up the major premise: human beings promote their "right state" – a state conducive of progressiveness – only if they promote enquiry. He then moves from an abstract major premise to a concrete minor premise:

> The interest of the established clergy requires that the established opinions should be believed, but it does not require that they should be believed upon evidence. Now our experience of human nature justifies us in affirming that whatever is done by a body of men is done in the way that which promises to give least

> trouble. The least troublesome way of making people believe is to make them believe upon trust, and not upon evidence. (350)

Mill presents the minor premise that the clergy does not promote enquiry, and in so doing closes the *modus tollens* argument that the teaching of the clergy does not promote the best human state. In doing so he provides syllogistic reasoning to support this minor premise (For a full rendering of the way these syllogisms are intertwined see the Appendix). All bodies of men act in a way that achieves their goals with greatest ease. The clergy is a body of men whose goal is to convince people to believe established opinions. Thus, they attempt to foster belief in established opinions in the easiest manner possible. It is easier to foster belief through trust than through evidence and enquiry, so it would follow that the clergy do not foster belief through evidence and enquiry. And from this Mill could conclude that the clergy do not promote progressiveness, humanity's "right state." *However,* Mill does not conclude in this way exactly; instead, he claims, "That love of ease therefore which is the characteristic of an established clergy is of itself sufficient to make them enemies to all enquiry, to improvement, to progression" (350).

What is most interesting about this passage is the way that Mill *suggests* the formalism of a syllogism. As Mill is arguing for the importance of inquiry, grounded thought, he is performing the action of grounding this thought for his audience. He is performing a sort of hyper-logical argument, not unlike Perelman and Olbrechts-Tyteca's quasi-logical arguments. The work as a whole forms a *modus tollens* syllogism to support the claim that clergyman do not promote the right state of man. 21 years before George Boole would publish *The Mathematical Analysis of Logic* and 53 years before Frege's *Begriffsschrift*, the syllogism would have been the height of formal presentation. Within Mill's larger syllogism, individual premises are themselves supported by syllogistic

reasoning – a string of connected intermediary conclusions that generate new premises. However, those reading the above paragraph and the below appendix will notice that I have done a decent bit of wrangling to force these matter of fact statements into the syllogistic form, the form on which Mill insists. Mill suggests the form of logical inquiry and in so doing rejects the clergy's ethos-driven, faith-based appeals both explicitly and implicitly, through the form of his appeal. It is as if Mill is just constructing an argument out of objective, necessary truths rather than debating in front of an audience. However, while rejecting the easy persuasion of the clergy, Mill's own suasory techniques do not appear to live up to his own logos driven standards. The larger *modus tollens* syllogism would conclude that the clergy do not promote the right, progressive human state. In presenting this conclusion Mill points to the "ease … characteristic of an established clergy" as if this orientation towards ease were specific to clergymen. But those following the chain of syllogisms closely will notice that he is only able to work this into his argument by claiming that it is a characteristic of groups of men in general, not clergymen in particular. That is, men in general have an orientation towards "ease;" by Mill's own argument this orientation is only characteristic of the clergymen in so far as they are men, not in so far as they are members of the clergy. In an argument that seems to unnecessarily foreground the reasoning process in generally accepted claims (Who would question that clergyman often use appeals to trust and faith to convince their audience?), Mill has not earned this particular claim, this critique of the clergymen as not just unprogressive but also lazy. But because he has convinced the audience to trust his method of inquiry, he suggests that this claim is earned. This logical appeal is, of course, a rhetorical move.

Importantly, Mill is actively presenting a syllogism, not an enthymeme. He carefully provides foundations for every claim, seemingly leaving nothing for his audience to add. However, by applying the notion of "ease" the way he does in the conclusion, Mill shows that he must rely on his audience to add something. In this case it is a sort of anti-religious sentiment that separates the rigor of Enlightenment enquiry and demonstration from the "ease" of faith-based persuasion. Presented to an audience without this temperament, this argument does not work. This speech, though given in the context of a debate, is largely epideictic. Mill, arguing for the rigors of an Enlightenment ideal, is in essence preaching to a choir. What is more important for his moves than the content he seems to be showing transparently is the presentation of a formalism. That is, the appearance of transparency is more important than what he is transparently presenting. By performing the formal rigors of a syllogism Mill successfully celebrates the Enlightenment epistemological stance of his audience.

This move is nonmonotonic in so far as the conclusion that the clergy is particularly lazy is a productive step for Mill's audience. Barring more complete information that would directly contradict this claim, Mill and his audience are able to move forward from this shared appearance. To apply this claim to the body of men that is the clergy and not to the body of men that is the London Debating Society requires a nonmonotonic reasoning structure. Mill and his audience are celebrating the rigorous path of inquiry and progress. However, Mill claims, "Now our experience of human nature justifies us in affirming that whatever is done by a body of men is done in the way that which promises to give least trouble." Such a claim, if applicable to all groups of men equally, would run counter to this celebration of rigor. Yet, the very structure of this

sentence suggests that its application is limited. It is based on their shared "experience of human nature" – that is, it is based on appearances, the as of yet incomplete set of information. This sentence is not the claim that all bodies of men take the path of greatest ease towards their goals; it is instead the claim that assuming there is nothing unusual about a particular body of men, then it takes the path of greatest ease towards their goals. Mill must rely on his audience to recognize that "ease" applies to the clergy but does not apply to them because they represent something unusual. In the same way that Ackerman is suggesting a way of reading particular symptoms, Mill is presenting a way of reading a particular appearance of university education. This reading is productive for his and his audience's shared goal – celebrating the Enlightenment project – so it is an acceptable conclusion to draw until it proves itself unproductive.

Conclusion

Emmanuelle Danblon, in an article that rejects the normative rules like those of the informal logics of van Eemeren and Grötendurst, contends that argumentation without rhetoric is "nonhuman" in at least two senses:

> First, it is not *human,* because it is not realistic, that is, it does not describe actual human rationality. Second, it is not *humanist* because it does not trust that human beings have the skills to ground rationality in public debates. Such an idealistic viewpoint necessarily grounds its rationality transcendental criteria, that is, criteria that are rational *because* they are "nonhuman." (496)

In many ways, I have presented a non-humanist account of the relationship between rationality and argumentation. Formal nonmonotonic logical systems are clearly not rhetorical (They are probably not examples of argumentation either – certainly not in Perelman and Olbrechts-Tyteca's sense of the term.). However, they do provide a new

lens through which to view such human rhetorical argumentation. While this notion of nonmonotonic reasoning is deeply interested in human rationality and trusts that it may ground public debates, that is clearly not its foundation.[5] Human reasoning does not take the form of a nonmonotonic logic. Instead, these logical systems provide a formal way of explaining and modeling the moves of human rationality. They do not explain or describe human rationality but rather describe the way that it functions in particular situations. While this may be disappointing from a particular humanist perspective, it can also be liberating. Logical domains or rhetorical situations need not be interesting just because they are human constructions, just because they explain a particular human rationality.[6] Instead, they may be of interest because of the particular situations they describe.

Alan Türing's (in)famous test suggests just such a view of intelligence: his goal was not to create a machine that thinks or learns like a human, but rather to create one that imitates human reasoning. Rejecting the question of consciousness – of how one thinks – is a pragmatic move. It sidesteps difficulties of solipsism or of demarcating the human from the non-human. However, unlike the informal logicians or argumentation theorists Danblon criticizes, an account of logical pluralism allows one to sidestep problems of foundationalism. The arguments' do not work because they follow the universally correct (or at least most advantageous) model of reasoning. They work because they work. Particular logics give us a way to recognize the way that they are working. A logic is a tool for analyzing the way an argument hangs together, what connects a series of claims. It is an explanation of how connective tissues are functioning. It is not an arbiter or a metric for determining whether or not an argument will function well. It does not abstractly show the way that the world hangs together or, for that matter,

make any claims of correspondence to some outside world. With such an approach in mind, the question of whether an argument follows a particular logic is not a matter of how well an argument works but is instead a matter of how well a particular logic *describes* the way an argument works. Logics present a potential new tool for the rhetorician, a tool that describes a facet of human argumentation. In the preceding examples, I hope that I have shown how the concept of a nonmonotonic logic is useful for describing those arguments.

I should be clear. It is not the intention of this paper to inspire rhetoricians to unearth yellow legal pads and begin writing formal proofs, to begin examining rhetorical situations for applicable models of logic and then formalizing argumentation. This would of course be unproductive. What this paper intends to do is to begin an exploration of the world of non-classical logics to show that contemporary logics and the study of rhetoric are not antithetical, to show that they are in many ways examining similar spaces. Moreover, while this paper intends to open doors of potential future scholarship and bridge disciplinary gaps, it does not pretend to correct nearly 2500 years of intellectual violence. Thus, I am not suggesting that rhetoricians adopt the practices of philosopher-logicians, nor am I advocating that we forgive those philosopher-logicians who have lauded formal rigor over the practical, pedagogical value of the sophists. What I am advocating is an examination of new and potentially fruitful ideas of logic in philosophy departments. The hard-headed, demonstration-oriented philosopher-logicians are doing things that look like rhetoric; perhaps, we rhetoricians should take a look.

Notes

[1] It's also entirely possible that these logicians do not think of rhetoricians at all because they do not realize that the discipline exists in a modern form.

[2] Consider the sets Φ, premises, and Ψ, possible conclusions, with regards to three formal arguments. As the set Φ increases, so does the set Ψ. Of course, most of the possible conclusions that make up Ψ are trivial. For instance with 2, the addition of 'R' only adds the tautologous conclusion 'R.'

	1	2	3
Φ	P➔Q, P	P➔Q, P, R	P➔Q, P, R, ~P
Ψ	P➔Q, P, Q	P➔Q, P, R, Q	P→Q, P, R, ~Q, …∞

[3] Walton, like Perelman with *eulogos*, suggests that we should translate *eikos* as "plausible" rather than "probable" because of the latter's close connection with statistics

[4] Stenning and Van Lambalgen denote "vague expressions" and "qualitiative-probabilistic adverbs." Such marking, though not critical to my argument, clearly shows the ways in which Ackerman's text departs from the domain of classical logic.

Vague Expressions	**Qualitative-Probabilistic Adverbs**
Chronic	often
small	usually
upper outer quadrant	most commonly
entire	may
painful	often
menstural disturbance	common
servous	usually
changes	approximately 15% of the cases
diffuse without sharp demarcations	may
firm, round and fluctuant	if
clear	usually
large	usually
feels like a tumour	infrequently
smoother and well-delimited	More often
enlarged	
Chronic	
large bluish	
small	

[5] Of course, even the most formal of systems created by humans has human rationality as its base in so far as it is a creation of human rationality.

[6] The move that I am making here is, of course, not dissimilar to that which Frege and Husserl make in rejecting logical psychologism. However, unlike Frege and Husserl I am not trying to transcend my humanity by articulating an objective account of how the world or semantic systems work. Instead, I am conceiving of such a move as a useful tool

– one that need not be measured as valuable by its consistency with the rationality that is humanity but rather one that may be useful for modeling human discourse and may also be valuable for other forms of intelligence as well. The difference is a matter of perspective: one feigns objectivity, the other recognizes situation but also does not pretend that the situation is the whole.

Appendix: Mill's Argument

Mill's argument presented as a set of syllogisms:

Major Premise: If a people promote progressiveness, humanity's right state, then they promote inquiry.

Minor Premise: The clergy does not promote inquiry.

[Syllogisms supporting the minor premise:

Major Premise: All bodies of men act to achieve their goals with greatest ease.

Minor Premise: The clergy is a body of men whose goal is to foster belief in established opinions.

Intermediate conclusion: The clergy will act to foster beliefs in established opinions with greatest ease.

Minor Premise: It is easier to foster beliefs by trust than by inquiry.

Conclusion: The clergy does not promote inquiry.]

Conclusion by modus tollens: The clergy does not promote progressiveness, humanity's right state.

Mill's argument presented in classical predicate logic with translations in accompanying brackets:

1-Place Predicates
B – is a body of men
2-Place Predicates
P – promote
G – has a goal
A – act to achieve with the greatest ease
Names
c – clergy
f – fostering beliefs in established opinions
i – inquiry
p – progressiveness
t – trust

Short Version

1. ∀x(Pxp → Pxi)	*[For all x, if x promotes progressiveness, then x promotes inquiry]*
2. ~Pci	*[It is not the case that the clergy promotes inquiry]*
∴3. ~Pcp	*[Therefore, it is not the case that the clergy promotes progressiveness]*

Long Version

1. ∀x(Pxp → Pxi)	*[For all x, if x promotes progressiveness, then x promotes inquiry]*

2. ∀x∀y((Bx & Gxy) → Axy)	*[For all x and for all y, if x is a body of men and x has the goal of y, then x acts to achieve y with the greatest ease.]*
3. Bc & Gcf	*[The clergy is a body of men, and the clergy has the goal of fostering beliefs in established opinions]*
4. Acf	*[The clergy acts to achieve fostering beliefs in established opinions with the greatest ease]*
5. ∀x(Axf → (Pxt & ~Pxi))	*[For all x, if x acts to achieve fostering beliefs in established opinions with the greatest ease, the x promotes trust, and it is not the case that x promotes inquiry]*
6. Pct & ~Pci	*[The clergy promotes trust, and it is not the case that the clergy promotes inquiry]*
7. ~Pci	*[It is not the case that the clergy promotes inquiry]*
∴8. ~Pcp	*[Therefore, it is not the case that the clergy promotes progressiveness]*

Crucially, this argument derives the conclusion that the clergy do not progressiveness from the fact that they are a body of men. Because they are a body of men, they act to achieve their goals with the greatest of ease, and it is easier to achieve their goals by promoting trust than by promoting inquiry. Therefore, they do not promote inquiry and hence do not promote progressiveness.

However, Mill adjusts this later in his speech and claims that the clergy are a body of men particularly interested in acting with the greatest ease. He is adjusting premise 2. One could take this as the claim that the clergy are a particularly lazy body of men – this seems to be what Mill asks his readers to assume. However, one could also take this as the claim that other bodies of men are less interested in achieving the goals only with the greatest. With the London Debating Society, Mill is addressing a body of men that he has himself assembled. And in such an address he is arguing that the path of rigor and inquiry are superior to the easy path of faith. Mill has presented premise 2 as useful for his argument, but upon further information, must adjust that claim. He must allow for exceptions. There are a set of unstated preconditions that must be true for premise 2 to be true.

2 becomes: Unless there is something funny, if x is a body of men and x has the goal of y, x acts to achieve y with the greatest of ease. Mill is relying on a chain of unstated assumptions which make up the unless clause. And by relying on such assumptions, by admitting the plausible and fallibilistic into his apparently rigid argument he relies on nonmonotonic reasoning.

Prolog representation of 2:

Prolog is a simple nonmonotonic logic designed for artificial intelligence and computational linguistics programming. While a thorough discussion of its workings is beyond the scope of this paper, of particular note is the way that it models conditional statements. Using the operator ":", prolog presents a constructive account of the conditional statement. The formula "is_quadriped: is_cat" could be roughly translated "if something is a cat, then it is a quadriped." Prolog is constructive in that you can add

antecedents without rewriting the formula. The above formula could be modified to "is_quadriped: is_cat, is_dog, not(is_three-legged_cat)." With this new modification, the formula has way of modifying claims with greater information.

Consider a formulation of premise 2 in prolog.
"Now our experience of human nature justifies us in affirming that whatever is done by a body of men is done in the way that which promises to give least trouble."

With this claim Mill initially presents this conditional:
act_to_achieve_goals_with_greatest_ease: is_a_body_of_men

However, to make sense of his unexpected conclusion and to avoid calling his audience lazy, this becomes:

act_to_achieve_goals_with_greatest_ease: is_a_body_of_men,
not(men_pursuing_inquiry)

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